

QIBA Dynamic Susceptibility Contrast (DSC-MRI) Biomarker Committee (BC) Call

Wednesday, January 13, 2021 at 11 a.m. (CST)

Call Summary

Participants

| | | | RSNA |
|------------------------|-----------------------|--------------------|--------------|
| Ona Wu, PhD (Co-Chair) | Mo Kadbi, PhD | Mark Shiroishi, MD | Joe Koudelik |
| Caroline Chung, MD | Nancy Obuchowski, PhD | Yuxiang Zhou, PhD | Susan Stanfa |
| Lisa Cimino, RT | Chad Quarles, PhD | | |

DSC Profile Update

- The [Stage 2: Consensus Profile](#) received DSC-MRI BC and MR CC approval and was published on the [Profiles page](#) of the QIBA Wiki

White Paper Plans

- The [DSC-MRI BC Google Drive](#) contains all materials, including a Word version of the Stage 2 Profile
 - Access can be requested from Dr. Erickson; a Google account is required to view and access materials
- Materials related to this effort can be found in the [White Paper folder](#) in the DSC-MRI BC Google Drive
- Dr. Wu drafted the [outline](#), which was reviewed and feedback was provided; it was inspired by Dr. Dave's paper, [Quantitative Imaging Biomarkers Alliance \(QIBA\) Recommendations for Improved Precision of DWI and DCE-MRI Derived Biomarkers in Multicenter Oncology Trials](#). *JMRI*. 2019; 49(7): e101-e121
- Research is needed to evaluate reproducibility and repeatability of DSC, as there is a dearth of test-retest data
- Findings from Dr. Wu's Round-6 NIBIB-funded round robin project on a static DSC phantom to be incorporated
- Clinical trial nuances for DSC to be highlighted
- In response to an inquiry about the phantom, it was noted that a vial in one of the two phantoms contained slightly different ingredients, so the phantoms used in the study were not identical
- Dr. Zhou volunteered to rescan the phantom and collect additional data, but Dr. Wu noted that this would be difficult
 - The phantom has since been disassembled and has been residing in an area that is not temperature-controlled, meaning that the agar may no longer be stable
 - Due to COVID-19 precautions, scan sessions need to be planned well in advance and an hour between scan sessions is required
 - Dr. Wu suggested to publish the study data already collected
 - Dr. Wu to follow up with Dr. Keenan (NIST) regarding phantom data write-up
- The proposed White paper title was, **Towards dynamic susceptibility contrast MRI-based quantitative imaging biomarkers for multi-center neuro-oncology trials**; suggestion to precede it with "QIBA Recommendations" to distinguish it from similar efforts
- Discussion re: to which publications it will be submitted; *JMRI* and *J of NeuroOncology* were recommended
- DSC-MRI BC members volunteered/were proposed for the following tasks, and anyone is welcome to participate:
 - Drs. Erickson and Shiroishi: clinical need for imaging biomarker and promise of AUC-TN as an imaging biomarker
 - Dr. Shiroishi provided an overview of the publication he will upload to the White Paper folder, which focuses on options for collecting DSC data (especially the acquisitions aspect) and its applications:
 - An evidence-based approach and rationale for protocol selection based on a literature search is outlined

- The most accurate approach to DSC scanning, from the clinical trials aspect, is reported in the conclusion
- It was noted that two other DRO papers were referenced in this publication
- Dr. Wu: current limitations of existing data and lack of test-retest data
- Drs. Obuchowski and Wu: Defining repeatability/reproducibility
- Sources of variability
 - Dr. Wu: Acquisition (Consensus paper)
 - Drs. Bell and Quarles: Model (e.g., Boxerman K2 or slope approaches) and Software implementation
- Drs. Erickson, Quarles, and Shiroishi: Normalization of CBV and ROI placement
- Drs. Wu and Zhou: Physical Phantom study
- Drs. Erickson and Quarles: DRO
- Future directions:
 - Drs. Erickson, Wu, and Zhou: Need for prospective human studies in normal volunteers and patients using “modern” acquisition approaches to assess sensitivity, specificity, precision
 - Dr. Quarles: Advanced dynamic phantoms (Dr. Quarles’ bioreactor phantom to be included)
- The goal is to have a rough draft of all sections by the next DSC-MRI BC call on Feb. 10
- Once the white paper has been completed, other DSC-MRI BC activities will begin, including planning a new Profile (most likely to focus on stroke) or designing a multi-center test-retest study of healthy volunteers to address gaps in the data for the existing Profile

Next DSC-MRI BC Call: Wednesday, February 10, 2021 at 11 a.m. CT

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